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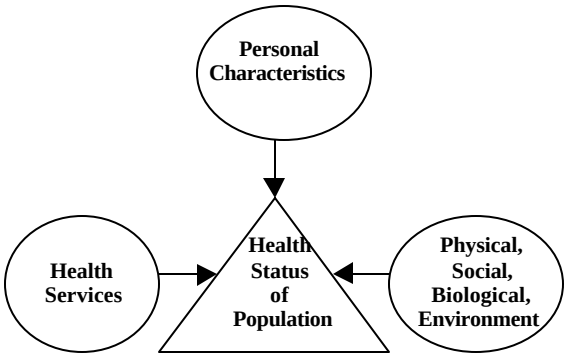
Health Care Epidemiology Introduction to Quality of Care

Whether producing widgets or organizing a health care system, quality assurance is a basic goal. However, health care has numerous inputs and outputs (outcomes). Individually, these inputs and outputs are often not well understood. Even when they are, the interactions of the inputs affect the outcomes in different and often unpredictable ways. Further, factors outside the direct influence of the personal or public health system affect the health status of people. Finally, positive outcomes (e.g. curing a disease) must often be balanced against negative outcomes (e.g. side effects), requiring a value judgment to be placed on what is a "good" outcome of care. The result of these complexities is that quality health care is extremely difficult to define and measure.

Epidemiology can evaluate what is quality health care by studying how the structure and process of personal and public health service delivery (exposure) affect the health status (outcome) of individuals and populations. This notebook addresses some of the key issues in the conceptualization of quality of care.

Health Care Epidemiology Triad



From Ibrahim (1985) (p. 7)[1]

Definition of Quality

Everyone agrees that high quality is a desired attribute of health care. However, defining what is truly meant by quality health care is controversial. The following definition was adopted by the Institute of Medicine in 1990: "quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (p. 21).[2] Consistent with this definition, epidemiology aims to identify the causes of outcomes. In health care epidemiology studies, the exposure of interest can be health care interventions (e.g. procedure, pharmaceutical products) or programs that are targeted at individuals or populations. These interventions or programs are designed to positively influence health status. Epidemiology focuses on this potential linkage.

While the ultimate goal of health care is to improve or maintain health status, there are other aspects of care that are often considered important for quality. Patient satisfaction and appropriate use of limited resources are often taken into account when determining if personal health care or public health services are of "high quality." For example, cost-effectivness analysis attempts to determine what interventions lead to the most benefit for the resources used.

Sample Definitions of Quality of Care

Institute of Medicine (p. 21)[2]

Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.

A Dictionary of Epidemiology (sponsored by the International Epidemiological Association) (p. 147)[3]

A level of performance or accomplishment that characterizes the health care provided. Ultimately, measures of the quality of care can always depend upon value judgment, but there are ingredients and determinants of quality that can be measured objectively.

Glossary of Terms Commonly Used in Health Care by the Academy of Health Services Research and Health Policy (p. 24)[4]

The degree to which delivered health services meet established professional standards and judgments of value to the consumer. Quality may also be seen as the degree to which actions taken or not taken maximize the probability of beneficial health outcomes or minimize the risk of other outcomes given the existing state of medical science and art.

Quality is frequently described as having three dimensions: quality of input resources (certification and/or training of providers); quality of the process of service delivery (the use

of appropriate procedures for a given condition); and quality of outcome of service use (actual improvement in condition or reduction of harmful effects).

American College of Medical Quality[5]

Medical quality is the degree to which health care systems, services and supplies for individuals and populations, consistent with the current professional standards of care, increase the likelihood for positive health outcomes.

Mark A. Callahan, MD, Chief of the Division of Outcomes and Effectiveness Research, Weil Medical College of Cornell University[6]

Doing the right thing, to the right patient, at the right time, in the right setting [one might add with the right outcome].

Basic Components of Quality

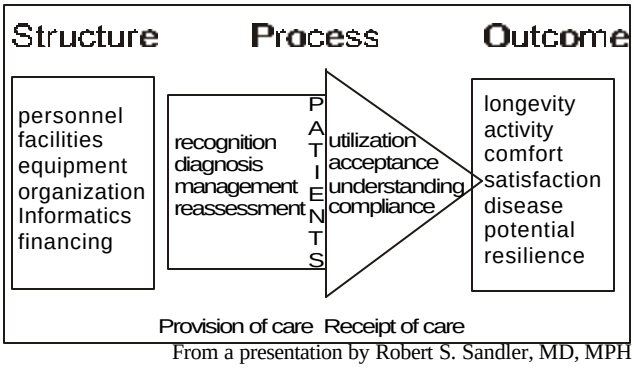
In 1966, Avedis Donabedian introduced the conceptualization of quality components that has formed the basis of many, if not most, modern models of health care quality. He described quality as having three principal components: structure, process, and outcome.[7]

Structure addresses the capacity of a system to provide health care services. In assessing this component of quality, one asks if the system has the input resources necessary to provide quality services. This can include such issues as properly trained staff, adequate equipment, organizational policies, patient accessible locations, appropriate hours of operation, and financial resources.

Process addresses what is done during the provision of care. This includes the appropriate procedures for a given condition based on the current state of health knowledge.

Outcomes address the impact of health care on the health status of the patient or population. Outcomes may include objective measures (e.g. presence of an infectious agent), patient perception of symptoms (e.g. pain), patient quality of life, or population health status. Donabedian includes patient satisfaction as an outcome. While satisfaction can affect a patient's perception of health status, it is not typically a focus of epidemiology.

Components of Quality



From a presentation by Robert S. Sandler, MD, MPH
Epidemiology 212, Medical Care Epidemiology
University of North Carolina at Chapel Hill, fall 2000
Adapted from Barbara Starfield, MD, MPH

In theory, appropriate structure leads to proper process of care that leads to the best possible outcomes. However, numerous factors such as a patient's physiologic reserve, current state of health care knowledge, confounding effects of different procedures, and random influences may alter the outcome of care.

Attributes of Effective Care

Health care has multiple attributes involving structure, process, and outcome. A useful mechanism for categorizing these attributes is to consider how they relate to accessibility, technical management, management of interpersonal process, and continuity of care.[8]

Access refers to one's ability to receive appropriate health care services.[4] Factors influencing access may be financial (e.g. lack of health insurance), geographic, organizational (e.g. lack of staff, hours of operation), or sociological (e.g. language barriers).[8,4] Process issues include timeliness of care, utilization patterns by factors such as sociodemographic characteristics of patients, time, place, and type of condition. Related outcomes include undiagnosed disease and preventable conditions.[8]

Technical management refers to the provision of care in a way that meets the standards of the procedure or services being provided. Examples of structural issues include having the correct equipment, trained personnel, and an appropriate scope of services. Process issues include adequacy of diagnostic work-up and treatment and adherence to current scientific and professional knowledge. Outcomes include morbidity, mortality, disability, and overall health status resulting from care.[8]

Management of interpersonal process refers to the relationship between patients and providers. Structural issues include having a stable relationship with a primary care provider and time for providers to interact with patients. Process issues involve the manner in which the provider and other personnel interact with the patient (e.g. how information is provided to patients, respect for privacy). Outcomes include issues such as patient understanding of conditions and adherence to a treatment regimen.[8]

Continuity "refers to care over time by a single individual or team of health professionals ('clinician continuity') and to effective and timely communication of health information (about events, risks, advice, and patient preferences) ('record continuity')" (p. 43).[9] Structural issues include arrangements for a coordinated source of care and for follow-up care. Process issues include the number of providers involved in care, interruptions in relationships with primary care providers, frequency of unscheduled visits, and follow-up for abnormal findings. Related outcomes include negative consequences resulting from issues such as inappropriate

scheduling of visits, lack of coordinated information sharing among providers, and lack of follow-up.[8]

Whose Quality?

Although we would like to think of quality measurement as entirely objective, it has many aspects that are dependent on perspective. Two questions that should be asked when taking on a quality assessment are[10]:

- **What is the setting?**
- **From what perspective is quality being assessed?**

There are many different settings or levels where quality can be assessed. These can include the individual physician, provider team, clinic location, hospital, integrated delivery system, managed care organization, or the health care system as a whole. As we move farther from where the direct interaction with the patient occurs, the issues of concern become broader in nature. The difference is in focus, not importance.

Quality may be viewed differently depending on who is assessing the quality. For example, providers may be most concerned with outcomes for their specific patients and ease of moving people through the system. Patients may be more concerned with their individual comfort and quality of life. A third party payer may focus on how limited resources can be used to achieve the best possible outcomes.

The importance of perspective can be seen when selecting outcome measures. It is not uncommon for clinicians to focus on the importance of objective findings such as laboratory or radiographic results. These findings are an indication of the seriousness of a condition, patients' prognosis, and appropriate clinical decisions. However, the patient may be far more concerned with quality of life issues like continence, ability to move, pain, ability to engage in social roles, etc. These are the true end results of the impact of the more objective measures. This is not to say that clinicians do not care about the more subjective issues affecting patients or that patients do not care about the objective measures. However, the focus of patients and that of clinicians may differ.

Measuring the Components of Quality

Assessing quality requires data about the system in which care is provided. As with all data used in epidemiologic studies, issues such as validity, reliability (see ERIC Notebook 22), expense, and time to collect data need to be considered.

Information on structure may come from sources such as:

- Review of organizational policies
- Review of provider credentials
- Examination of physical facilities
- Surveys of patients and providers on issues such as hours of operation, transportation, physical access to facilities, and insurance coverage

Data sources on process should yield information on what is actually done throughout the provision of care, rather than on what one intends to do. Potential sources include:

- Medical records (paper or computerized)
- Automated administrative records (e.g. insurance claim records)
- Patient surveys
- Video recordings of patient visits
- Results for simulated patients to determine what providers do during visits

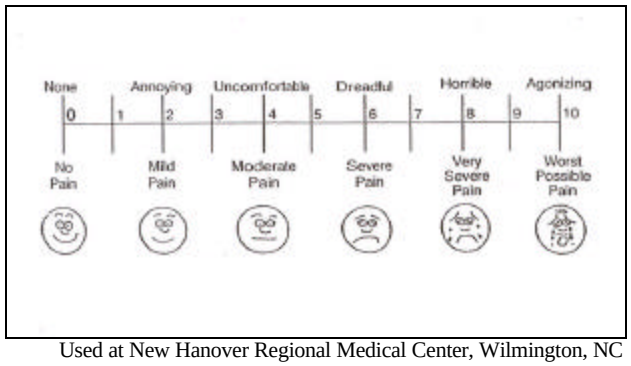
Data sources on outcomes include:

- Medical records (paper or computerized)
- Automated administrative records (e.g. insurance claim records)
- Quality-of-life questionnaires administered to patients
- Physical examination

Information on satisfaction can be obtained from:

- Satisfaction surveys administered to all patients
- In-depth interviews with randomly selected patients
- Focus groups of patients

Example of Outcome Collection Instrument Pain Ruler



Used at New Hanover Regional Medical Center, Wilmington, NC

How Do You Know You Have Achieved Quality?

One reality is that many people leave the health care system in less than perfect health. As a result, it

may not be readily apparent when quality has been achieved. Before starting a quality assessment effort, it is necessary to determine the following attributes of the issues being considered[10]:

- **Criterion**-What level of measurement would indicate quality? For example, having a policy may indicate structural quality, patients receiving preventive services X number of times a year may indicate process quality, and a complication rate of Y or below may indicate outcome quality.
- **Standard**-For many areas, evidence-based standards of care have been developed. These can serve as a basis for developing criteria. However, many areas of health care do not have evidence-based standards. In these cases, local standards of care may serve as the standard. Further, local conditions may require that national standards be adapted to the realities of where the care is being provided.
- **Data Source**-It is necessary to determine if data are available or can reasonably be collected.

Donabedian Matrix

At the end of this Notebook, you will find an example of a matrix that combines the components of quality and attributes of effective care described above. The matrix can serve as a framework for starting a quality assessment process.

Crossing the Quality Chasm

In 2001, the Institute of Medicine released the report Crossing the Quality Chasm, A New Health System for the 21st Century. This report presents a plan for redesigning the United States health care delivery system to provide appropriate, quality health services.

The report lays out six aims for the health care system. These aims demonstrate the wide variety of issues involved in quality care. These aims say the system should be (quoted from pp. 5-6).[11]

- **Safe**-avoiding injuries to patients from the care that is intended to help them.
- **Effective** -providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and overuse, respectively).
- **Patient-centered**-providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.
- **Timely**-reducing waits and sometimes harmful delays for both those who receive and those who give care.
- **Efficient**-avoiding waste, including waste of equipment, supplies, ideas, and energy.
- **Equitable**-providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.

Conclusion

As demonstrated by the wide variety of goals outlined in the Quality Chasm report, health care quality is a very broad topic. Epidemiology aids in the process of measuring quality by linking structure and process of service delivery (exposure) to health status (outcome). The expansive nature of quality means that quality assurance efforts should begin with defined objectives around which a wide variety of issues, such as those outlined in this ERIC Notebook, can be considered.

Helpful Web Sites:

Agency for Healthcare Research and Quality
http://www.ahrq.gov

American College of Medical Quality
http://www.acmq.org

American Health Quality Association
http://www.ahqa.org

American Society for Healthcare Risk Management
http://www.ashrm.org

Baldrige National Quality Program
http://www.quality.nist.gov/

Joint Commission on the Accreditation of Healthcare Organizations
http://www.jcaho.org

National Association for Healthcare Quality
http://www.nahq.org

National Committee on Quality Assurance
http://www.ncqa.org

National Quality Forum
http://www.qualityforum.org

Veterans Administration-National Center for Patient Safety
http://www.patientsafety.gov

Veterans Administration-Office of Research and Development
http://www.va.gov/resdev

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2 Lohr, K. N. (ed.). (1990). Medicare: A Strategy for Quality Assurance, Volume 1. Washington, DC: National Academy Press. [Institute of Medicine report available on the Internet at http://www.nap.edu/catalog/1547.html]

3 Last, J. M. (ed.). (2001). A Dictionary of Epidemiology (4th ed.). New York: Oxford University Press.

4 Academy for Health Services Research and Health Policy. (2002, February). Glossary of Terms Commonly Used in Health Care. Washington, DC: author. [available on the Internet at http://www.ahsr.org/publications/glossary.htm]

5 American College of Medical Quality. (1996, March). Policy 1: Definition of medical quality. Professional Polices. Bethesda, MD. author. [available on the Internet at http://www.acmq.org/profess/policy1.htm]

6 Callahan, M. A. (2001, January). The Role of Guidelines and Outcomes Research in Improving the Quality of Healthcare (video recording, Program #780). Secaucus, NJ: Network for Continuing Medical Education.

7 Donabedian, A. (1966). Evaluating the quality of medical care. Milbank Memorial Fund Quarterly, 44. 166-203.

8 Donabedian, A. (1980). Explorations in Quality Assessment and Monitoring, Volume I, The Definition of Quality and Approaches to its Assessment. Ann Arbor, Michigan: Health Administration Press.

9 Donaldson, M. S., Yordy, K. D., Lohr, K. N. & Vanselow, N. A. (eds.). (1996). Primary Care, America's Health in a New Era. Washington, DC: National Academy Press. [Institute of Medicine report available on the Internet at http://www.nap.edu/catalog/5152.html].

10 Based on information presented in Health Policy and Administration 263, Quality and Utilization Management, at the University of North Carolina at Chapel Hill, Fall 1997, Susan I. DesHarnais, Ph.D., instructor.

11 Committee on Quality of Health Care in America. (2001). Crossing the Quality Chasm, A New Health System for the 21st Century. Washington, DC: National Academy Press. [Institute of Medicine report available on the Internet at http://www.nap.edu/catalog/10027.html].

Additional Readings on the Topic:

Baldrige National Quality Program. (2002). 2002 Health Care Criteria for Performance Excellence. Gaithersburg, MD. author. [available on the Internet at http://www.quality.nist.gov/HealthCare_Criteria.htm]

Hurtabo, M. P., Swift, E. K. , & Corrigan, J. M. (eds.). (2001). Envisioning the National Heath Care Quality Report. Washington, DC: National Academy Press. [Institute of Medicine report available on the Internet at http://www.nap.edu/catalog/10073.html].

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (eds.). (2000). To Err is Human, Building a Safer Health System. Washington, DC: National Academy Press. [Institute of Medicine report available on the Internet at http://www.nap.edu/catalog/9728.html].

President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry. (1998, March). Quality First: Better Health Care for All Americans. Silver Spring, Maryland: Agency for Healthcare Research and Quality Publications Clearinghouse. [available on the Internet at http://www.hcqualitycommission.gov].

Donabedian Quality Matrix
Quality Elements

	STRUCTURE	PROCESS	OUTCOME
ACCESSABILITY	**Criterion:** **Standard:** **Data Source:**	**Criterion:** **Standard:** **Data Source:**	**Criterion:** **Standard:** **Data Source:**
TECHNICAL MANAGEMENT	**Criterion:** **Standard:** **Data Source:**	**Criterion:** **Standard:** **Data Source:**	**Criterion:** **Standard:** **Data Source:**
INTERPERSONAL PROCESS	**Criterion:** **Standard:** **Data Source:**	**Criterion:** **Standard:** **Data Source:**	**Criterion:** **Standard:** **Data Source:**
CONTINUITY	**Criterion:** **Standard:** **Data Source:**	**Criterion:** **Standard:** **Data Source:**	**Criterion:** **Standard:** **Data Source:**

Perspective:_____
Setting:_____

Based on Donabedian, A. (1980). Explorations in Quality Assessment and Monitoring, Volume I, The Definition of Quality and Approaches to its Assessment. Ann Arbor, Michigan: Health Administration Press and information presented in Health Policy and Administration 263, Quality and Utilization Management, at the University of North Carolina at Chapel Hill, Fall 1997, Susan I. DesHarnais, Ph.D., instructor.

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